

soideis, subsigmoideis, apiculatis, 1-2-septatis, 20-24 μ longis, 4.8-6.5 μ latis, apicibus (2-3 μ longis) inclusis; paraphysibus filamentosis, septatis, ramosis, apice brunneolis, conglutinatis; hypothecio pallide brunneo; strato interiore subhyalino; cortice crasso, atro, exterius rugoso; statu conidico in natura et culturis indeprehenso.

Hab. in cortice ramorum vivorum *Pini virginianae*.

Apothecia emerging from the bark over cankered areas, scattered or in more or less dense groups, coriaceous, sessile or substipitate, subglobose, then expanded and patellate, 1.5-2 mm in diameter, with lacerate, undulate margin, inrolled on drying, then hysteriform, triangular, or irregularly compressed, furfuraeous, dark brownish ("blackish brown" to "fuscous-black"); hymenium pruinose, light to dark brown or nearly black ("dark vinaceous-drab" to "raisin black" and sometimes lighter, "pinkish buff" or "cinnamon-rufous"); asci cylindric-clavate, gradually attenuated toward the base, broadly rounded to slightly flattened at the apex, 8-spored, 80-110 \times 10-12 μ ; spores hyaline, fusoid to subsigmoid with sharply pointed or apiculate ends, biseriata above, irregularly uniseriate below, continuous with granular contents, at last 1-septate or more rarely 2-septate, unstricted, 20-24 \times 4.8-6.5 μ , including the apiculae, 2-3 μ in length; paraphyses filamentous, septate, branched, slightly swollen at the apex, becoming granular incrustated and forming a brownish epithecium which in age breaks into islands or tufts that tend to break away; hypothecium of pale brown, fine, densely interwoven hyphae;

medullary layer 100-150 μ thick, subhyaline, appearing loose in hyphal structure; cortex about 50 μ thick at the margin and 200 μ at the base, of compacted, black, thick-walled, closely septate hyphae which on the surface build hyphal clumps that give the exciple a furfuraeous appearance.

On cankered twigs and small branches and on main stems of seedlings of *Pinus virginiana* Mill. in Virginia and North Carolina, probably widespread but infrequent.

Specimens examined.—VIRGINIA: Shenandoah County, May 25, 1933, R. W. Davidson (F. P. 66206); Goochland County, June 23, 1933, J. D. Diller 75 (F. P. 66204) and July 25, 1940, J. D. D. 1002 (F. P. 94036); New Kent County, June 20, 1933, J. D. D. 29-A (F. P. 66208) and July 25, 1940, J. D. D. 1003 (F. P. 94034); Spotsylvania County, June 23, 1933, J. D. D. 71 (F. P. 66207) and July 25, 1940, J. D. D. 1001 (F. P. 94035, *type*); George Washington National Forest, July, 1933, J. D. D. 213-A (F. P. 66209). NORTH CAROLINA: Alamance County, June 28, 1933, J. D. D. 123 (F. P. 66205).

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ENTOMOLOGY.—*New species of Anastrepha and notes on others (Diptera, Tephritidae)*.¹ ALAN STONE, Bureau of Entomology and Plant Quarantine.

As was expected when work was terminated on the writer's revision (7)² of the genus *Anastrepha*, several new species have since come to light. The present paper is designed to describe these new species and to publish additional information of interest concerning others. Some of this material is from the continued active collecting of

James Zetek, while the species from Venezuela and British Guiana were submitted by Pablo Anduze and J. N. Knull, respectively.

There has been some confusion concerning the correct family name for the fruit flies commonly known as Trypetidae. The essential facts that led to the adoption in this paper of the little-used name Tephritidae are as follows: Until very recently the writer was not aware that the name Trypetidae was not the first name used for the

¹ Received June 20, 1942.

² Numbers in parentheses refer to literature cited at the end of the paper.

family, so that when *Trypeta* Meigen fell as a synonym of *Euribia* Meigen [see Stone (6, p. 410)] it seemed necessary to change to the name Euribiidae. It now appears that the name Trypetidae was not used until 1862 by Loew (2, p. 49), whereas Newman in 1834 (5, p. 396) introduced the name Tephrites as a "Natural Order" under the Stirps Muscina, and based on the genus *Tephritis*. In 1835 Macquart (3, p. 447) used the name Tephritidae as the name of a "sous-tribu," and other workers such as Bigot, Walker, Frey, and Hendel have used it since then. Since it is desirable, if not mandatory, to follow priority in family names, and since the well-established name of Trypetidae must be dropped if we consider a synonym not available as the basis of a valid family name, it appears advisable to accept the family name Tephritidae. The only other possibility would be the name Trupaneidae, arrived at either by basing the family name on the name of the oldest included genus or by sinking *Tephritis* as a subgenus of *Trupanea*. The former procedure, mentioned (by citation of the name Trypaneinae), but not accepted, by Hendel in 1910 (1, p. 311), would not be sanctioned by the International Commission of Zoological Nomenclature in this case (opinion 133), whereas the latter, although suggested by Malloch in 1931 (4, p. 276), is not sound from a taxonomic standpoint.

Anastrepha gigantea, n. sp.

Figs. 4, 8

Very large, yellow-orange. Clypeal ridge strongly protuberant, with no median depression. Mesonotum 5.0 mm long, orange, with humerus, lateral stripe from transverse suture to scutellum, very slender median stripe fading out posteriorly, and scutellum paler; pleura mostly pale yellowish; metanotum entirely yellow orange. Macrochaetae black; pile yellow orange. No sternopleural bristle. Wing 13.5 mm long, the band along costa yellow orange, the other bands brownish; costal and S-bands joined from anterior margin of wing to cell R_1 , the hyaline band only very faintly indicated in cells R_1 and R_{2+3} ; V-band complete and broadly joined to S-band anteriorly; vein R_{2+3} slightly undulant; vein M_{1+2} curved forward to

meet apex of S-band. *Female terminalia*: Ovipositor sheath 9.4 mm long, tapering from base to short distance beyond spiracles and then nearly parallel-sided to apex; spiracles about 1.8 mm from base. Rasper of rather large hooks in several rows. Ovipositor about 9.0 mm long, with a slight lateral swelling beyond end of oviduct but no distinct serrations.

Type material.—Holotype, female (U.S.N.M. no. 56317).

Type locality.—El Cermeño, Panamá.

The single specimen was trapped by James Zetek, February 6, 1940. This, the largest known *Anastrepha*, will fit into neither half of the first couplet of the writer's key to species. Among the species with a swollen clypeal ridge it is nearest to *benjamini* Lima, but it is quite distinct in wing pattern and terminalia.

Anastrepha doryphoros, n. sp.

Figs. 7, 14

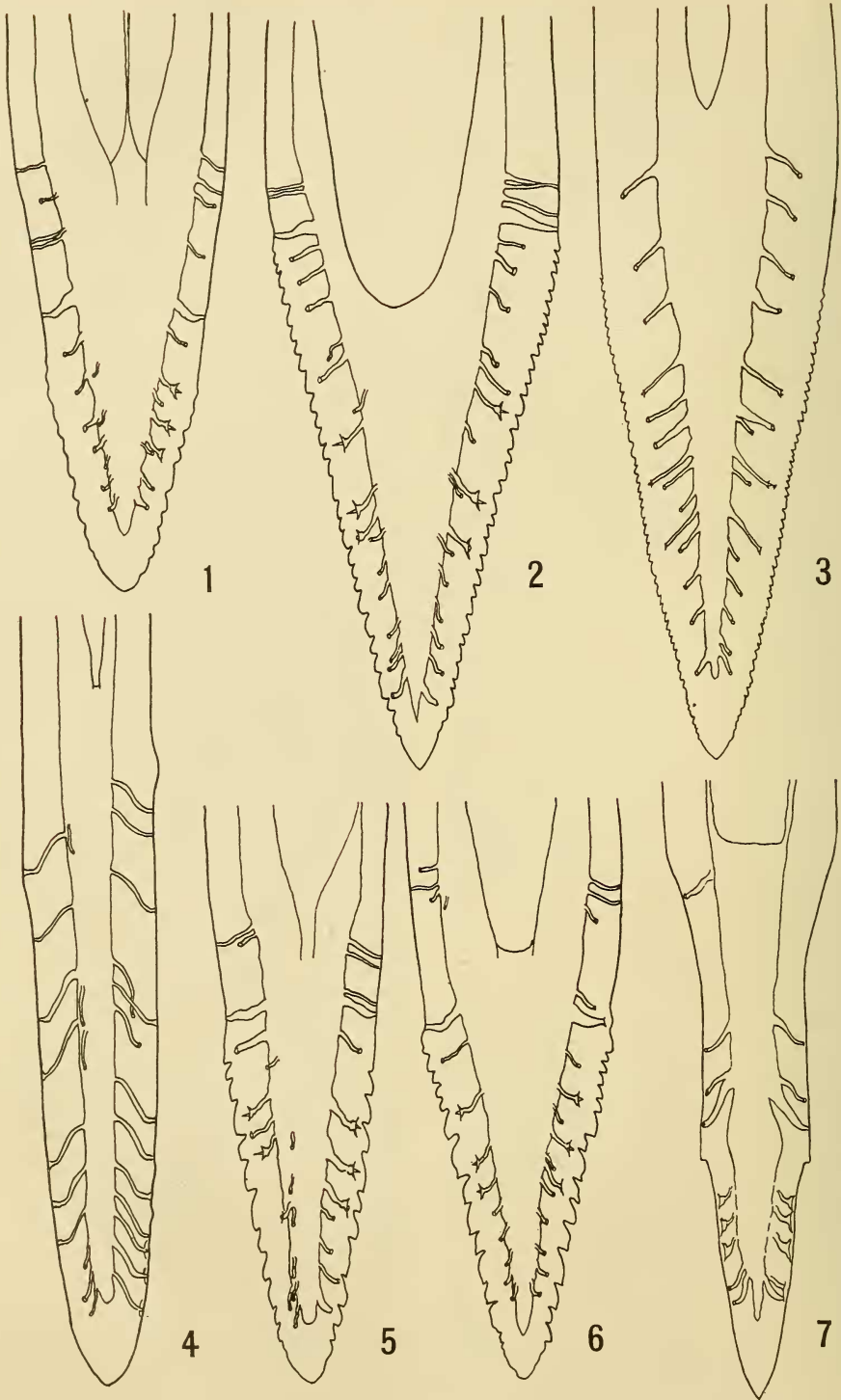
Large, yellow-orange. Mesonotum 3.7 mm long, yellow orange, with narrow median stripe slightly widened posteriorly, border of transverse suture, sublateral stripe from transverse suture to scutellum, and scutellum yellowish white; pleura mostly pale yellowish; metanotum entirely yellow orange. Macrochaetae black; pile orange-brown. Sternopleural bristle very fine. Wing 10.0 mm long, the pattern yellow-orange on basal-anterior portion, brownish on apical-posterior portion; most of wing colored, but costal cell, a spot at apex of vein R_1 extending into cell R_{2+3} , a spot near base of cell R_{4+5} , most of cell 2nd M_2 , cell M_1 , anal lobe, and a poorly defined band across cell Cu_1 hyaline or subhyaline. *Female terminalia*: Ovipositor sheath 9.0 mm long, tapering to slender apical half, the spiracles 1.65 mm from base. Rasper 1.07 mm long, the hooks rather small, gradually decreasing in size basally; tip 0.32 mm long, with abrupt constrictions just distad of end of oviduct, a slight flaring to base of serrate portion, and then tapering to apex, the serrations indistinct, occupying less than half of tip.

Type material.—Holotype, female (U.S.N.M. no. 56318).

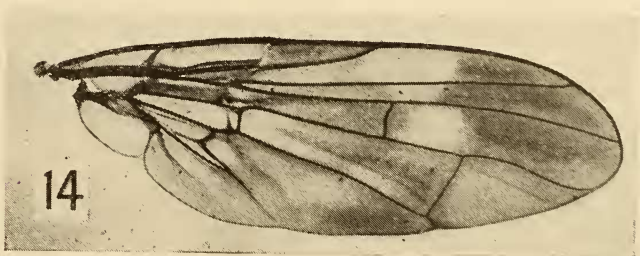
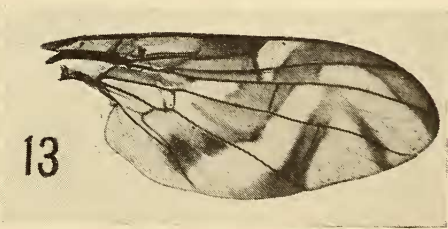
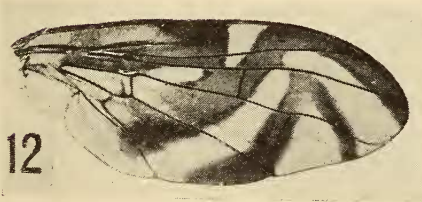
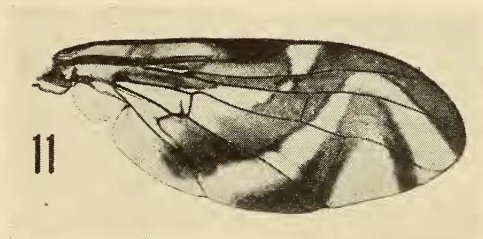
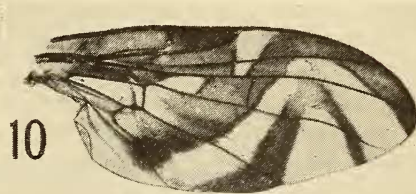
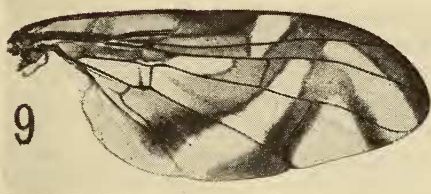
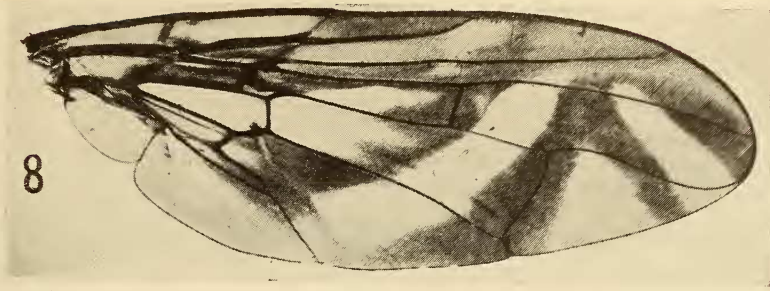
Type locality.—El Cermeño, Panamá.

The single specimen was trapped by James Zetek, December 5, 1939.

This species goes to couplet 19 in the writer's



Figs. 1-7.—Ovipositor tips of new species of *Anastrepha*: 1, *teli*; 2, *anduzei*; 3, *dryas*; 4, *gigantea*; 5, *parishi*; 6, *guianae*; 7, *doryphoros*.



Figs. 8-14.—Wings of new species of *Anastrepha*: 8, *gigantea*; 9, *parishi*; 10, *teli*; 11, *dryas*; 12, *anduzei*; 13, *guianae*; 14, *doryphoros*.

key, but can be carried no further because of the atypical wing pattern with no distinct S-band. The relationship of this species is not at all clear. The rather elongate rasper somewhat resembles that in *balloui* Stone, but the wing pattern and ovipositor tip are unlike those of any other species known to the writer.

Anastrepha anduzei, n. sp.

Figs. 2, 12

Medium sized, yellow-brown; mesonotum 2.5–3.6 mm long, yellow brown, with humerus, median stripe expanding posteriorly, sublateral stripe from transverse suture to scutellum, and scutellum yellowish white; pleura above, including all of metapleuron, yellowish white; metanotum entirely yellow-orange. Macrochaetae black, pile pale, yellow-brown. No sternopleural bristle, or a very weak one. Wing 6.5–8.5 long, the bands yellow-brown; costal and S-bands rather broadly connected along vein R_{4+5} , V-band complete, usually narrowly joined to S-band anteriorly. *Female terminalia*: Ovipositor sheath 2.5–2.7 mm long, rather stout, tapering apically, the spiracles about 0.5 mm from base. Rasper of medium-sized, rather compressed hooks in four or five rows. Ovipositor 2.2–2.4 mm long, rather stout, the base distinctly widened, the tip finely serrate from acute apex to a point basad of end of oviduct; width at base of serrate portion more than half distance from apex of ovipositor to end of oviduct. *Male terminalia*: Tergal ratio about 1.0; clasper about 0.34 mm long, stout basally, flattened apically, tapering to an acute apex; teeth at or near middle; a distinct postero-lateral swelling at level of teeth.

Type material.—Holotype, female (U.S.N.M. no. 56319); paratypes, 90 females, 77 males U. S. National Museum and Museo Nacional de Ciencias, Caracas, Venezuela).

Type locality.—San Estaban, Carabobo, Venezuela.

Distribution.—State of Carabobo, Venezuela.

The holotype and 13 paratypes were collected at San Estaban, November 22 to 30, 1939, and the remaining paratypes at San Estaban from December 1, 1939, to January 7, 1940, and at Puerto Caballo, on January 13, 1940, by Pablo Anduze, for whom the species is named.

In the writer's key this species would run to *lutzi* Costa Lima in couplet 71, but it differs

from *lutzi* in having the costal and S-bands of wing much more broadly connected, in having distinct pale stripes on mesonotum, and in having sides of ovipositor tip less angulate.

Anastrepha parishi, n. sp.

Figs. 5, 9

Medium sized, yellow-orange. Mesonotum 3.25 mm long, yellow-orange, with an indistinct median stripe widening posteriorly, humerus, lateral stripe from transverse suture to scutellum, and scutellum paler; pleura yellow-brown, brighter yellow just below notopleuron; metanotum entirely yellow-orange. Macrochaetae orange brown; pile pale yellowish. No sternopleural bristle. Wing 7.5 mm long, the bands yellow brown; costal and S-bands connected at vein R_{4+5} ; V-band joined to S-band anteriorly; vein M_{1+2} nearly reaching apex of S-band. *Female terminalia*: Ovipositor sheath 2.7 mm long, the spiracles about 0.95 mm from base. Rasper of moderate sized hooks in a compact mass of 7 or 8 rows. Ovipositor 2.5 mm long, rather slender, the base slightly widened, the tip 0.26 mm long, tapering, with about 10 rather flat teeth on each side.

Type material.—Holotype, female (U.S.N.M. no. 56320).

Type locality.—Bartica, British Guiana.

The single specimen was collected by H. S. Parish, August 20, 1901. I take great pleasure in naming the species in honor of its collector.

This species would run to *irretita* Stone in couplet 84 of the writer's key, but differs in having the serrations of the ovipositor tip beginning nearer the apex of the oviduct, and in having the V-band of the wing joined to the S-band anteriorly.

Anastrepha teli, n. sp.

Figs. 1, 10

Medium sized, yellow-orange. Mesonotum 3.0–3.5 mm long, yellow-orange, with narrow median stripe widening posteriorly to include the acrostichal bristles, humerus, and lateral stripe from transverse suture to scutellum yellowish white; usually an indistinct dark spot on scuto-scutellar suture; pleura pale yellowish; metanotum entirely yellow orange. Macrochaetae nearly black; pile brownish, paler on median stripe. Sternopleural bristle very weak or absent. Wing 7–8 mm long, the bands orange

to brown; costal and S-bands connected on vein R_{4+5} ; V-band complete, separated from S-band. *Female terminalia*: Ovipositor sheath 2.68–3.0 mm long, the spiracles about 1.0 mm from base. Rasper of moderate sized hooks in about 6 rows. Ovipositor 2.4–2.6 mm long, rather stout, the tip 0.22–0.28 mm long, tapering to a rather blunt apex, with about 10 inconspicuous rounded serrations on scarcely more than apical half.

Type material.—Holotype, female, paratypes, 3 females (U.S.N.M. no. 56321).

Type locality.—El Cermeño, Panamá.

Distribution.—Panamá.

The holotype was trapped at the type locality October 17, 1939, by James Zetek. Two topotypes were trapped December 12, 1939, and February 6, 1940. The third paratype was trapped at La Campana, Panamá, December 14, 1938.

This species runs to *irretita* Stone, in couplet 84 of the writer's key, but the ovipositor tip is not angulate at the base of the serrate portion and the serrations are shallower. It differs from *parishi* in having the serrations begin considerably farther from the apex of the oviduct, and in having the V-band of the wing separated from the S-band.

Anastrepha guianae, n. sp.

Figs. 6, 13

Medium sized, yellow-brown. Mesonotum 3.36 mm long, yellow-brown, with humerus, median stripe widening posteriorly to include the acrostichal bristles, lateral stripe from transverse suture to scutellum, and scutellum paler yellow; pleura mostly pale yellowish; metanotum narrowly darkened laterally. Macrochaetae rather dark orange-brown; pile pale yellow. Sternopleural bristle rather strong, yellow brown. Wing 7.5 mm long, the bands yellow brown; costal and S-bands rather broadly connected at vein R_{4+5} ; V-band complete, very narrowly joined to S-band anteriorly. *Female terminalia*: Ovipositor sheath 2.18 mm long, rather stout, about 0.88 mm from base. Rasper of rather stout hooks in a triangular patch of about 5 rows. Ovipositor 2.01 mm long, slightly widened at base, the tip 0.25 mm long, tapering from base of serrate portion to rather acute apex, with about 16 serrations on each side.

Type material.—Holotype, female (U.S.N.M. no. 56322).

Type locality.—Bartica, British Guiana.

The single specimen was collected by H. S. Parish, August 26, 1901.

This species would run to couplet 86, but it differs from *zuelaniae* Stone in having no constriction between the end of the oviduct and the beginning of the serrations, and in having the V-band of the wing narrowly joined to the S-band; it differs from *turpiniae* Stone in having the serrations of the ovipositor tip more extensive, the nonserrate portion of the tip less tapering, and the V-band of the wing narrowly joined to the S-band.

Anastrepha dryas, n. sp.

Figs. 3, 11

Medium sized. Mesonotum 3.0 mm long, orange-brown, with humerus, a median stripe expanding abruptly posteriorly to reach the dorsocentral bristles, a lateral stripe from just in front of transverse suture to scutellum, and scutellum pale yellow; pleura mostly pale yellow; metanotum entirely yellow-orange. Macrochaetae brownish black; pile yellowish brown. Sterno-pleural bristle very weak. Wing 7.5 mm long, the bands orange yellow and brown; costal and S-bands narrowly connected at vein R_{4+5} and hyaline triangle beyond stigma constricted or closed at vein R_{2+3} ; V-band rather broad anteriorly, entirely separated from S-band; vein R_{2+3} slightly undulant at level of hyaline triangle. *Female terminalia*: Ovipositor sheath 3.86 mm long, tapering to apical third and then nearly parallel sided, the spiracles 1.1 mm from base. Rasper of many long, curved hooks in about 11 rows. Ovipositor 3.53 mm long, the extreme base slightly widened, the apical portion slightly widened to level of serrations; ovipositor tip about 0.4 mm long, the many minute serrations starting at basal fifth and the serrate portion tapering to an acute point.

Type material.—Holotype, female (U.S.N.M. no. 56323).

Type locality.—San Esteban, Carabobo, Venezuela.

The single specimen was collected by Pablo Anduze between December 1 and 6, 1939.

This species will run to *duckei* Costa Lima in couplet 90, but differs from *duckei* in being a

smaller species, with many more teeth in the rasper, and with a stouter ovipositor tip, not at all constricted basad of the serrate portion. The species is also close to *dissimilis* Stone, the terminalia being very similar, but the median portion of the S-band is considerably narrower in *dissimilis*, so that the costal and S-bands are widely separated.

NEW RECORDS FOR ANASTREPHA SPECIES

Distribution

As a result of the study of additional material including the new species described in this paper, the following new records of distribution have been discovered:

ARGENTINA (10)³:

Anastrepha dissimilis Stone. Two females and two males reared at Corrientes, May 9, 1941, from *Passiflora*, by H. L. Parker.

BRITISH GUIANA (11):

Anastrepha fraterculus (Wied.); *A. guianae*, n. sp.; *A. parishi*, n. sp.; *A. serpentina* (Wied.).

PANAMÁ (59):

Anastrepha doryphoros, n. sp.; *A. gigantea*, n. sp.; *A. perdita* Stone, a female, trapped at El Cermeño, January 27, 1942, by James Zetek; *A. subramosa* Stone (inadvertently omitted from list in writer's revision); *A. teli*, n. sp.

UNITED STATES (16); TEXAS (11):

Anastrepha lathana Stone, Webb County, Tex., December 4, 1940, G. H. Shiner.

VENEZUELA (15)

Anastrepha anduzei, n. sp.; *A. cordata* Aldrich; *A. dryas*, n. sp.; *A. grandis* (Macquart); *A. manihoti* Costa Lima.

Food Plants

Additional reared material, from various sources, has resulted in the following new³ data on food plants:

³ Numbers in parentheses here after each country indicate the total number of species now known.

Achras sapota L. (Sapotaceae). Experimental food plant of *Anastrepha flavipennis* Greene by James Zetek.

Eugenia coloradoensis Standley (Myrtaceae). *Anastrepha fraterculus* (Wied.) on Barro Colorado Island, reared by James Zetek.

Eugenia variabilis Baillon (Myrtaceae). According to Max Kisliuk, the guarobeiera, listed in the writer's paper as host of *bahiensis* and *bon-dari*, is this species.

Labatia standleyana (Pittier) (Sapotaceae). The first recorded natural food plant for *Anastrepha flavipennis* Greene, reared by James Zetek from El Cermeño, Panamá, June 17, 1941. *A. serpentina* (Wied.) was reared from this host at the same time.

Lucuma obovata HBK. (Sapotaceae). Dr. J. E. Wille, chief of the Peruvian Entomological Service, has informed the writer that this is the preferred host of *Anastrepha serpentina* (Wied.) in Peru, the infestation sometimes being very heavy.

Mangifera indica L. (Anacardiaceae). Experimental food plant of *Anastrepha flavipennis* Greene by James Zetek.

Passiflora sp. (Passifloraceae). *A. dissimilis* Stone reared at Corrientes, Argentina, by H. L. Parker.

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